

## **REMARKS**

### **Allowable Subject Matter**

Applicants gratefully appreciate the Examiner's indication that claim 24 is allowed and that claims 6, 18, and 19 recite allowable subject matter.

### **Amendments**

Claim 1 is amended to incorporate the feature from claim 2, which is now cancelled. Claims 3 and 6 are amended to depend from claim 1, rather than cancelled claim 2. Claim 17 is amended to depend from claim 3, rather than claim 2 (compare claims 5 and 17). Allowable claim 18 is amended to be in independent form. Claim 19 is amended to depend from claim 5. Claim 24 is amended to correct minor typographical errors.

New claims 25 and 26 are similar to claims 3 and 7, and depend from allowed claim 24. New claim 27 corresponds to the prior version of claim 1.

### **Election and Withdrawn Claim**

In the Office Action of November 21, 2007, the Examiner acknowledges that applicants have elected Species A. However, the Examiner further states that in making this election applicants "did not distinctly and specifically point out the supposed errors in the **restriction requirement.**" (emphasis added). It is noted that no Restriction Requirement has been made, only an Election of Species Requirement. Applicants have not acquiesced to any alleged Restriction Requirement.

Furthermore, as indicated in MPEP 806.04(d), once a generic claim is held to be allowable, all of the claims drawn to species in addition to the elected species will ordinarily be allowable. In the instant case, the Examiner has indicated that generic claim 24 is allowed. Thus, claims that were previously indicated as withdrawn should now be included in the examination, i.e., claims 3 and 21-23.

### **Drawing Objection**

In response to the Drawing Objections, applicants submit herewith revised Figures 1-4. In revised Figures 1-4, reference numeral 13 is now used to identify the baffles. The prior reference numeral 130 in Figures 1 and 3, and 13 in Figures 2 and 4, have been deleted. Also, Figure 3 is revised to include reference numeral 101 to identify the reactor-exchanger. Withdrawal of the objection is respectfully requested.

### **Objection to the Specification**

The prior objection to the specification regarding the use of reference numeral 13 to identify baffles in the Figures is rendered moot by the corrections to the drawings. Withdrawal of the objection is respectfully requested.

### **Rejection under 35 USC 102(b) in view of Fuderer (US 4,650,651)**

Claims 1, 2, 4, 5, 17 and 20 are rejected as allegedly being anticipated in view of Fuderer (US 4,650,651). This rejection is respectfully traversed.

Fuderer (US '651) discloses an integrated primary-secondary reforming apparatus. A partly reformed effluent is formed in the primary reformer zone which comprises a shell and tube arrangement with reformer catalyst in the tubes. The partly reformed effluent discharges from the catalyst-filled tubes and is passed, via a conduit through a catalyst bed, to the feed end of a secondary reformer zone. At the feed end of the secondary reformer zone, the effluent from the primary reformer zone combines with pre-heated oxygen-containing gas and passes through the catalyst bed in the secondary reformer zone. The effluent from the secondary reformer zone passes through the shell side of the primary reformer zone thereby providing heat for the endothermic reaction occurring within the catalyst-filled tubes of the primary reformer zone. See, e.g., column 4, lines 13-28.

Referring to the Figure, a mixture of hydrocarbon feed and steam is introduced into the integrated primary-secondary reforming apparatus 3 via line 1. This feed mixture is introduced into catalyst-filled tubes 4 present in the primary reformer zone 5. The resultant partly reformed

effluent is discharged from the catalyst-filled tubes into a conduit 7. This conduit extends through the catalyst bed 8 of the secondary reformer zone 6 and discharges the partly reformed effluent into reaction space 9 above catalyst bed 8.

Preheated oxygen-containing gas is introduced into reaction space 9 via line 10, and a portion of hydrocarbon/steam feed mixture is introduced into reaction space 9 via line 11. The reaction mixture in secondary reformer zone 6 passes first through catalyst bed 8, then through the supporting bed 20 of alumina particles, and into the shell side of the primary reforming zone 5 thereby heating the hydrocarbon/steam feed mixture passing through the catalyst-filled tubes of the primary reformer zone 5. The secondary reformer zone effluent then exits the integrated primary-secondary reforming apparatus via line 22.

To establish anticipation, the rejection must indicate where the asserted anticipatory reference discloses each and every feature of the rejected claim. See, e.g., *Ex parte Levy*, 17 USPQ2d 1461, 1462 (POBA 1990) [“Moreover, it is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference.”].

As discussed further below, the instant anticipation rejection is improper since it fails to indicate where each of the features of independent claim 1 are disclosed. Thus, the rejection should be withdrawn.

In the rejection, it is asserted that line 10 of US ‘651 represents a means for supplying preheated gas containing oxygen and water. Thus, the rejection alleges that line 10 of US ‘651 corresponds to means (12) for supplying a preheated gas that contains oxygen and optionally water vapor as recited in applicants’ claim 1. This assertion, however, fails to take into account the further description in claim 1 regarding means (12).

Claim 1 recites that means (12), i.e., the means for supplying preheated gas, comprises an annular chamber that is essentially coaxial with the jacket of the reactor. The reactor disclosed by US ‘651 fails to describe or suggest any means for supplying preheated gas that is in the form of an annular chamber. The structure asserted in the rejection as constituting means for supplying a preheated gas that contains oxygen, i.e. line 10, is merely an inlet at one end of the reactor. It is not in the shape of an annular chamber, let alone an annular chamber that is essentially coaxial with a jacket of the reactor.

Applicants note that in the rejection it is stated that, with respect to US '651, "wherein said means (12) for supplying preheated gas comprises an annular chamber (where the lines 10 & 11 enter the reactor as illustrated) that is essentially coaxial with said the reactor jacket (30 & 31)." This statement is confusing and inaccurate. Reference numeral 12 in US '651 refers to a diversion line for diverting a portion of feed gas through an external primary reformer unit 17. Reference numeral 12 does not refer to a means for supplying preheated gas. Moreover, none of lines 10, 11, and 12 in US '651 is in the shape of an annular chamber.

The rejection asserts that numeral (5) in US '651 identifies a second chamber in accordance with applicants' claim 1. Reference numeral (5) in US '651 identifies the primary reformer zone of the reactor and contains catalyst-filled primary reactor tubes (4). Although it is asserted in the rejection that the second chamber (i.e., zone 5) of US '651 indirectly exchanges heat with the means for supplying preheated gas (line 10), this is incorrect. Zone (5) is not located in the same part of the reactor as line 10 and thus these two structures do not come into indirect heat exchange relationship.

Furthermore, as noted above, zone 5 of US '651 contains catalyst-filled primary reactor tubes (4). Zone 5 is essentially in the form of a shell and tube reactor wherein effluent from the secondary reforming zone 6 pass along the outside of the tubes (4), i.e., through the shell side. Furthermore, baffles 21 are provided among the tubes so as to direct flow of the effluent from the secondary reforming zone 6. As a result of this shell and tube arrangement, zone 5 does not have a volume suitable for carrying out piston flow. Compare the second chamber recited in applicants' claim 1.

The primary reformer zone 5 of the reactor of US '651 does not have a first zone and a second zone. In particular, the rejection fails to demonstrate how primary reformer zone 5 of US '651 possesses a first essentially adiabatic zone. Further, the rejection is devoid of any explanation as to how such a first essentially adiabatic zone is linked to a linking means or how a second zone of primary reformer zone 5 exchanges heat with means for supplying preheated gas. Compare applicants' amended claim 1.

With respect to the linking means, the rejection states the linking means between the asserted first chamber (zone 6) and the asserted second chamber (zone 5) is "illustrated." The

rejection fails to indicate what structure constitutes this linking means.

Zones 5 and 6 are separated by a bed 20 of ball-shaped alumina particles. If this is the asserted “linking means,” the rejection fails to identify the “orifice” of bed 20 that constituted the orifice in the linking means recited in applicants’ claim 1.

In view of the above remarks, it is evident that US ‘651 fails to describe, pursuant to 35 USC 102, a reactor in accordance with applicants’ claimed invention. Withdrawal of the rejection is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

/Brion P. Heaney/  
Brion P. Heaney, Reg. No. 32,542  
Attorney for Applicant(s)

MILLEN, WHITE, ZELANO  
& BRANIGAN, P.C.  
Arlington Courthouse Plaza 1, Suite 1400  
2200 Clarendon Boulevard  
Arlington, Virginia 22201  
Telephone: (703) 243-6333  
Facsimile: (703) 243-6410

Attorney Docket No.: PET-2115

Date: February 21, 2008